

INTERACTION BETWEEN SOIL NITROGEN AND IMAZAMOX ON PALMER AMARANTH CONTROL IN SUNFLOWER. Amar S. Godar, Phillip W. Stahlman, and J. Anita Dille, Graduate Research Assistant, Department of Agronomy, Kansas State University, Manhattan, KS 66506, Research Weed Scientist, Kansas State University Agricultural Research Center, Hays, KS 67601, and Associate Professor, Department of Agronomy, Kansas State University, Manhattan, KS 66506.

Greenhouse and field experiments were conducted in Kansas in 2008 and 2009 to investigate the interaction between soil N level and imazamox rate on Palmer amaranth control and crop seed yield in imidazolinone-tolerant sunflower. Treatments included factorial arrangements of three soil N levels (28, 56, and 84 kg/ha) and two imazamox rates (26 and 35 g ai/ha) plus no imazamox and hand weeded control treatments. Density of Palmer amaranth in greenhouse experiments was 400 plants/m<sup>2</sup> and density in field experiments was ~100 and 20 plants/m<sup>2</sup> in 2008 and 2009, respectively. In both greenhouse and field experiments at the time of imazamox application, height of Palmer amaranth plants grown in the highest soil fertility treatment was taller than recommended on the imazamox label and taller than plants in the two lower soil fertility treatments. Differences in Palmer amaranth height between soil N levels in the 2009 field experiment were smaller than in all other experiments. Palmer amaranth biomass reduction did not differ between imazamox rates at any of the three soil N levels in the 2009 field experiment, or at the 56 kg/ha soil N level in all other experiments. However, the 35 g/ha rate of imazamox was more effective than the 26 g/ha rate at the lowest and highest fertility levels. These results indicate that the lower-than-labeled rate of imazamox tested (26 g/ha) can be as effective as the recommended use rate (35 g/ha) when soil N level is not limited and size of Palmer amaranth plants does not exceed label recommendation, but the labeled rate is more effective under condition of low soil fertility and on larger, rapidly-growing plants. Sunflower seed yield in 2008 was not determined because of heavy bird predation. In 2009, soil N level did not affect sunflower yield except in hand weeded plots. Averaged over soil N level, sunflower treated with 26 and 35 g/ha rates of imazamox yielded similarly and averaged 75% higher yield compared to the no imazamox treatment. These results indicate that herbicide application is more important than soil N level in preventing seed yield loss from moderate densities of Palmer amaranth infestation in sunflower.